

115 Sycamore Street New School Building

Community Forum 2 – Design and Sustainability

November 10, 2026

PERKINS EASTMAN
Human by Design

COMMUNITY FORUM 2

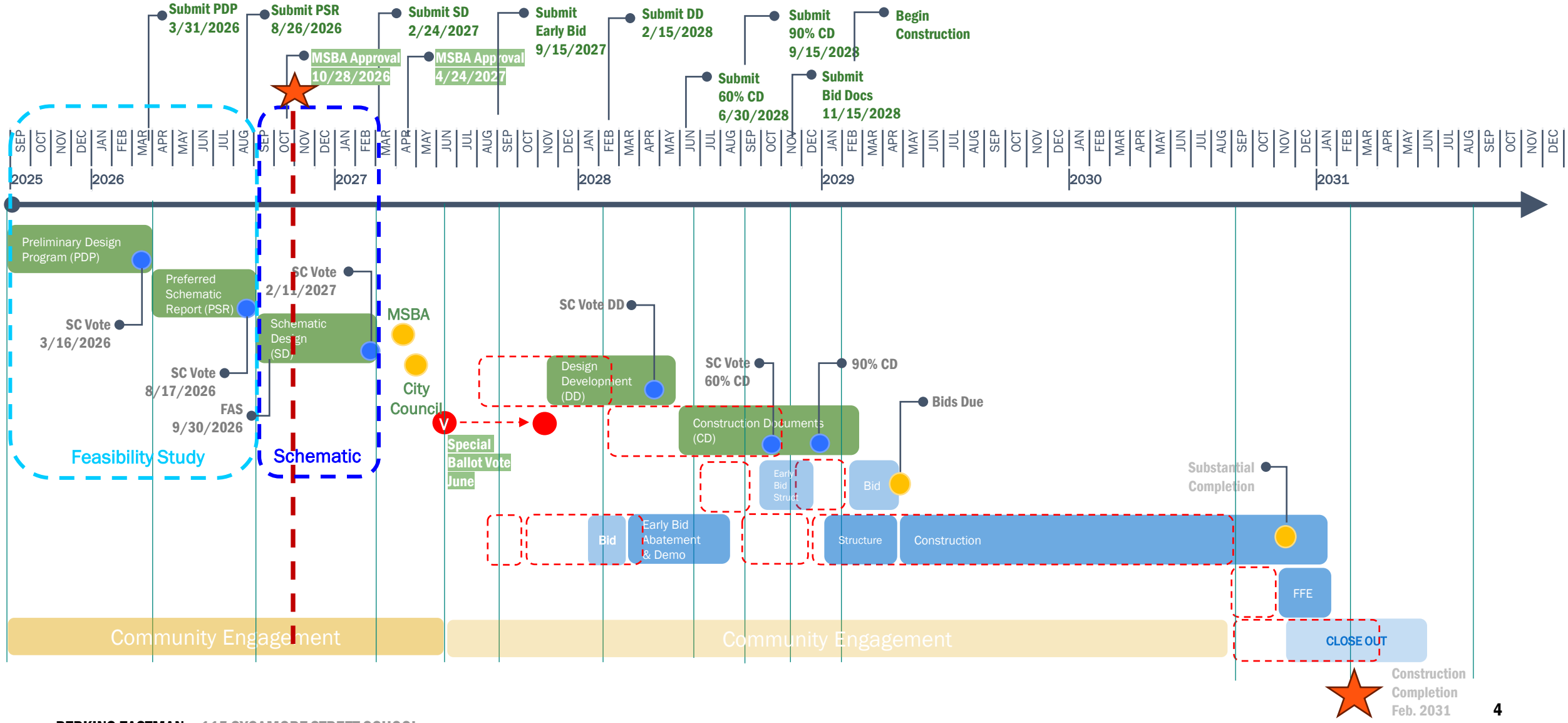
1. Schedule and Design Update - *25 min*
2. Sustainability Parameters - *30 min*
3. Transportation *5 min*

   Q & A – *15 min*

4. Prioritize/Gather Feedback - *30 min*
   - Station 1 Climate
   - Station 2 Energy
   - Station 3 Community/Learning

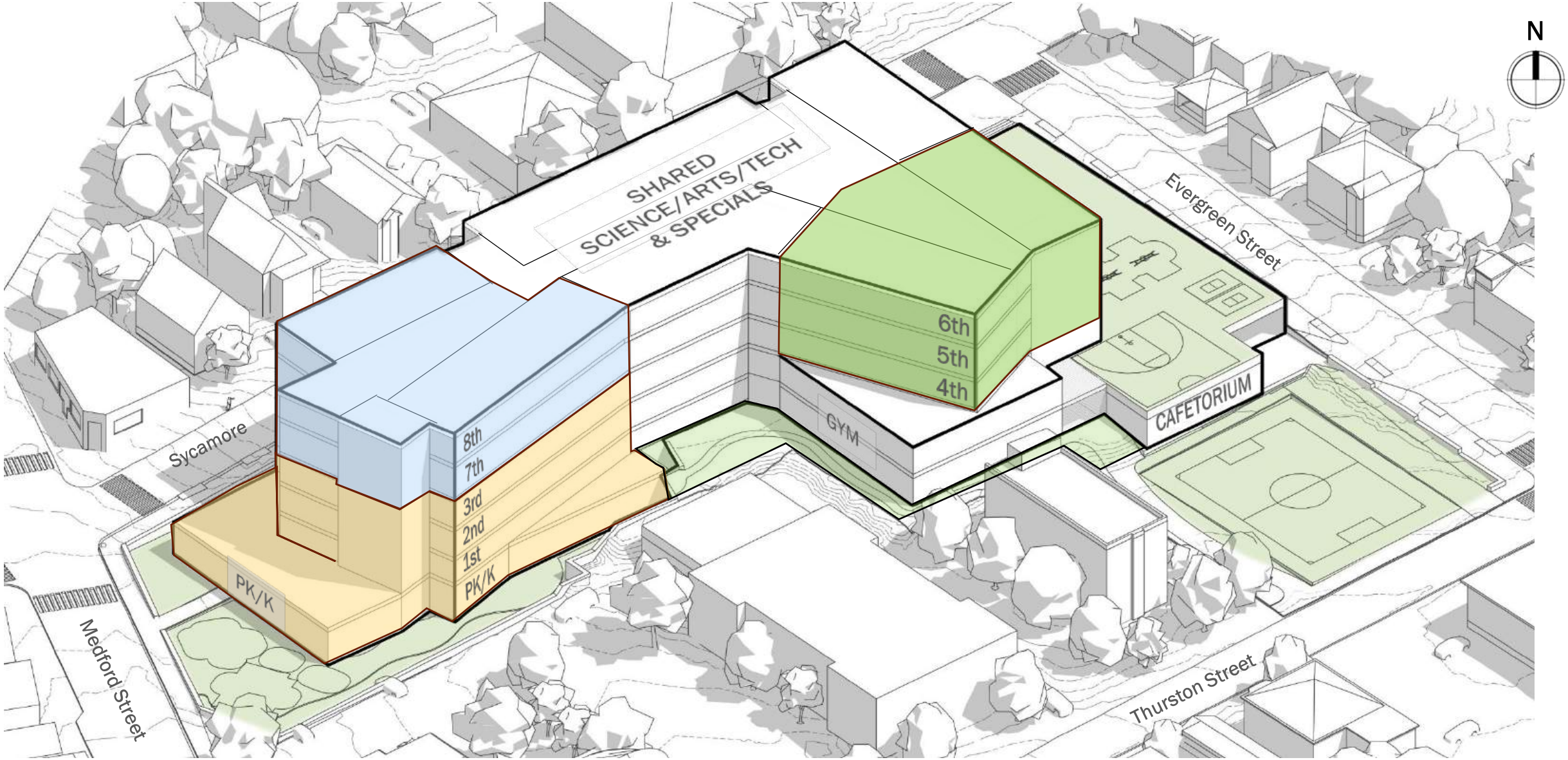
DESIGN UPDATE

PROJECT TIMELINE



NEW SCHOOL MASSING AXON

GRADE LEVEL CLUSTERS



NEW SCHOOL FLOOR PLANS

925 STUDENTS PK-8



DESIGN FOR NEURODIVERSITY:

1. Calming Approach
2. Clarity of School Layout
3. Views & Connections to Nature
4. Themed Learning Neighborhoods
5. Large & Small Group Spaces
6. Distributed Support Services
7. Sensory & Regulation Spaces
8. Group Activity Alternatives
9. Quiet Cafeteria Zone

+ Acoustic, Lighting & Thermal Comfort, Biophilic Qualities, Materials & Colors

NEW SCHOOL FLOOR PLANS

925 STUDENTS PK-8

B.O. BREAKOUT

- ADMIN / GUIDANCE / NUR
- ART / MUSIC / STE
- CLASSROOM
- CAFE / GYM / MEDIA
- SPECIAL EDUCATION
- STOR / CUST / TLT



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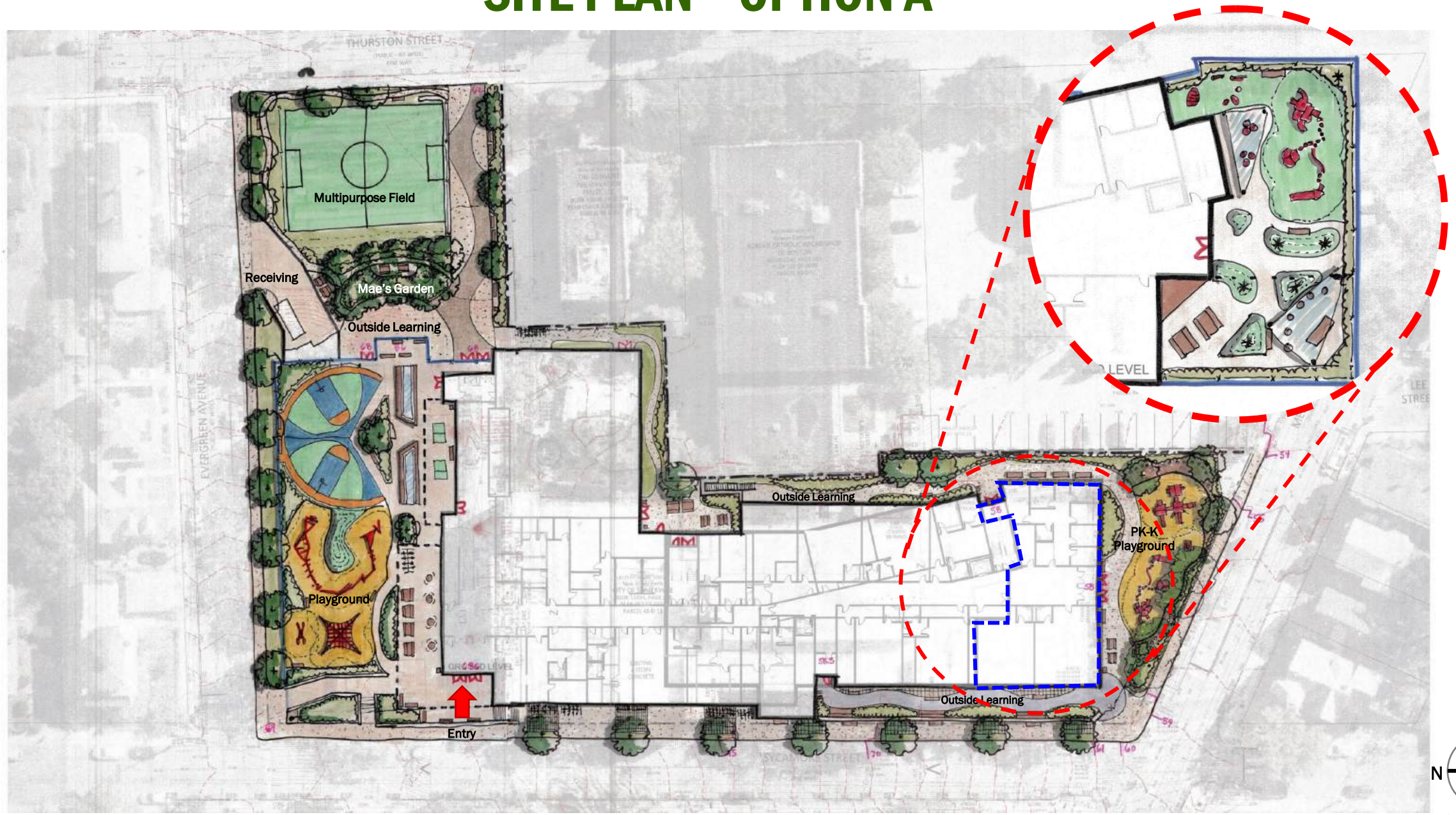
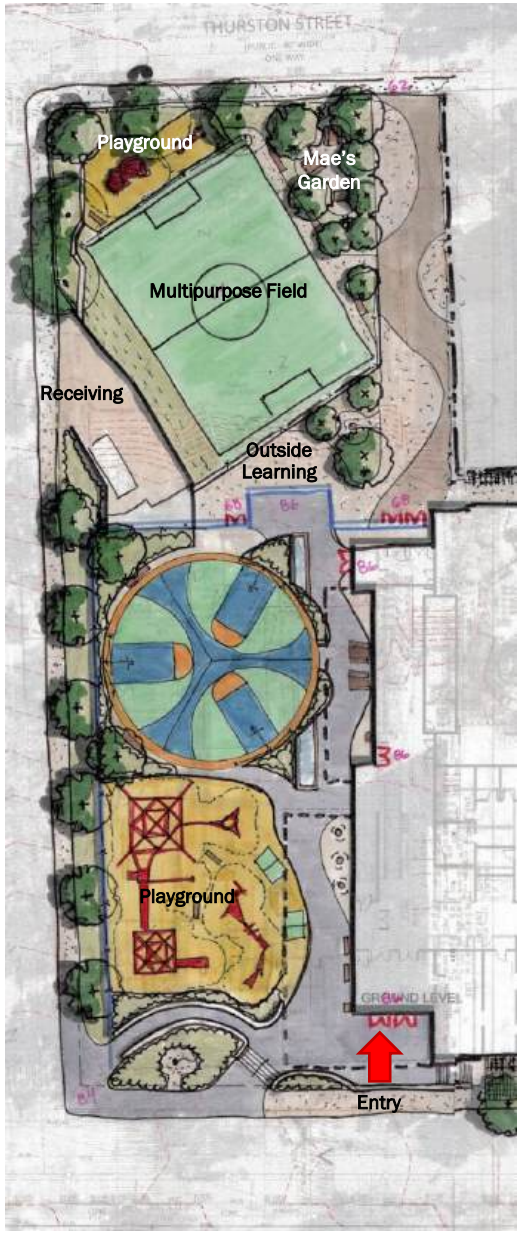
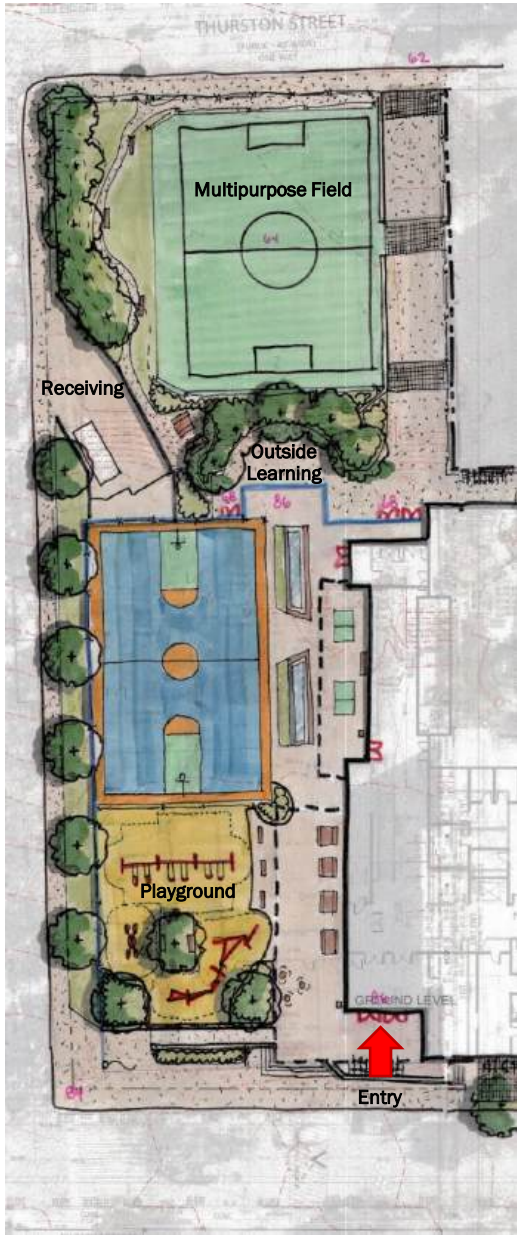
SITE PLAN – OPTION A

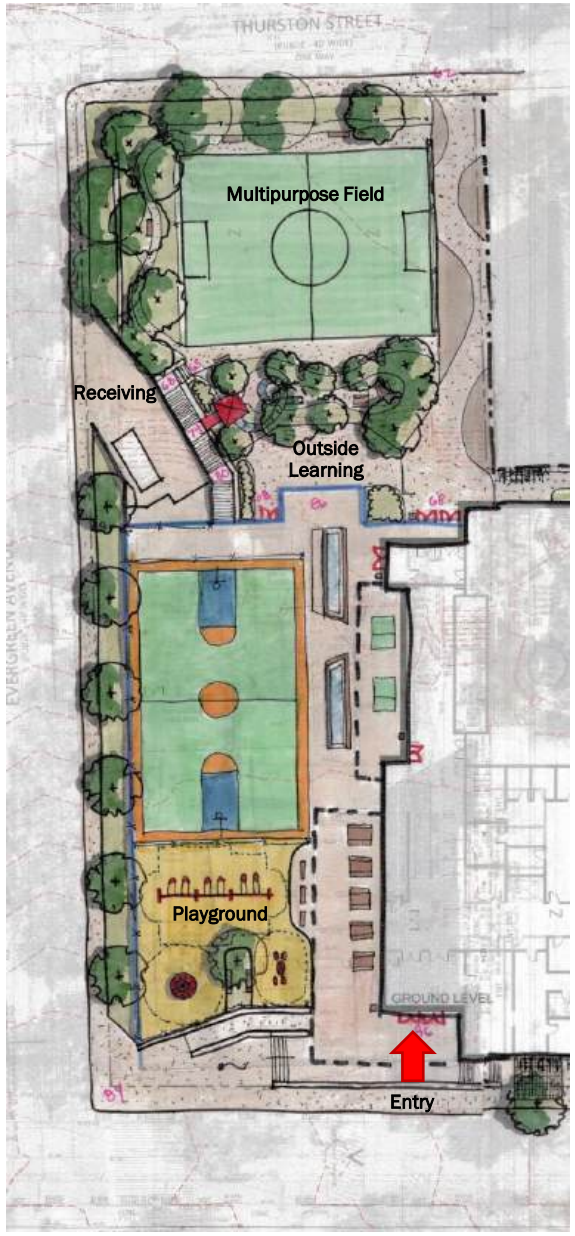


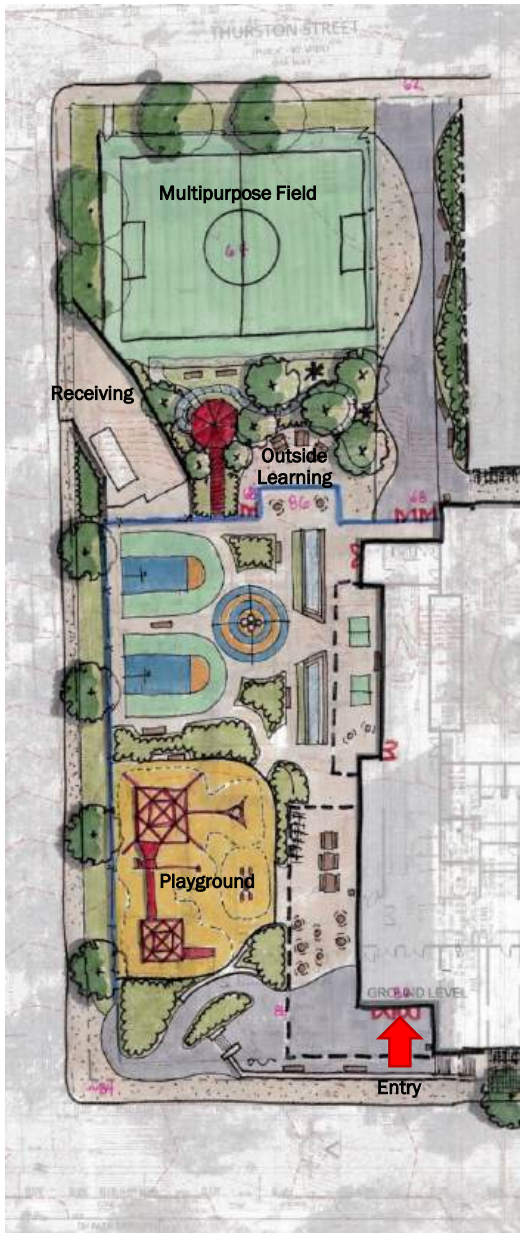
TRAVERSE landscape architects

SITE PLAN – OPTION









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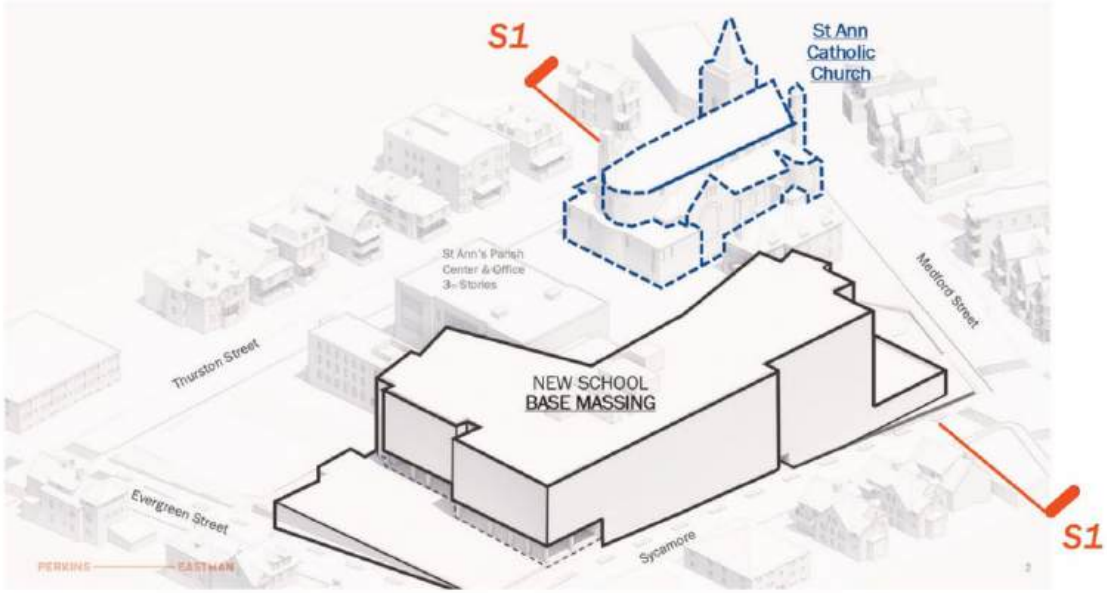
TRAVERSE landscape architects

Civic Scale

UNDERSTANDING THE CONTEXT

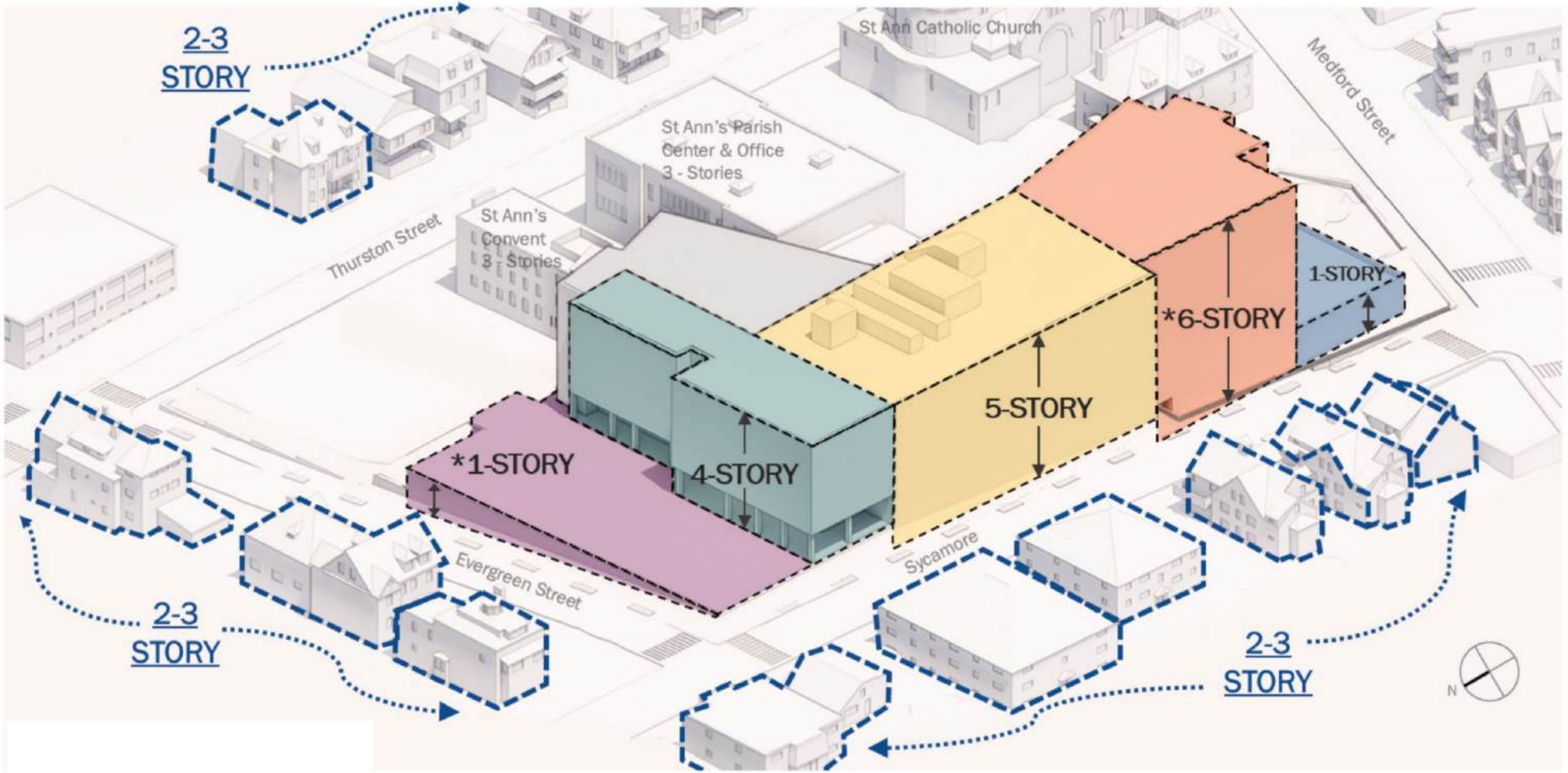




S1 EAST / WEST SITE SECTION

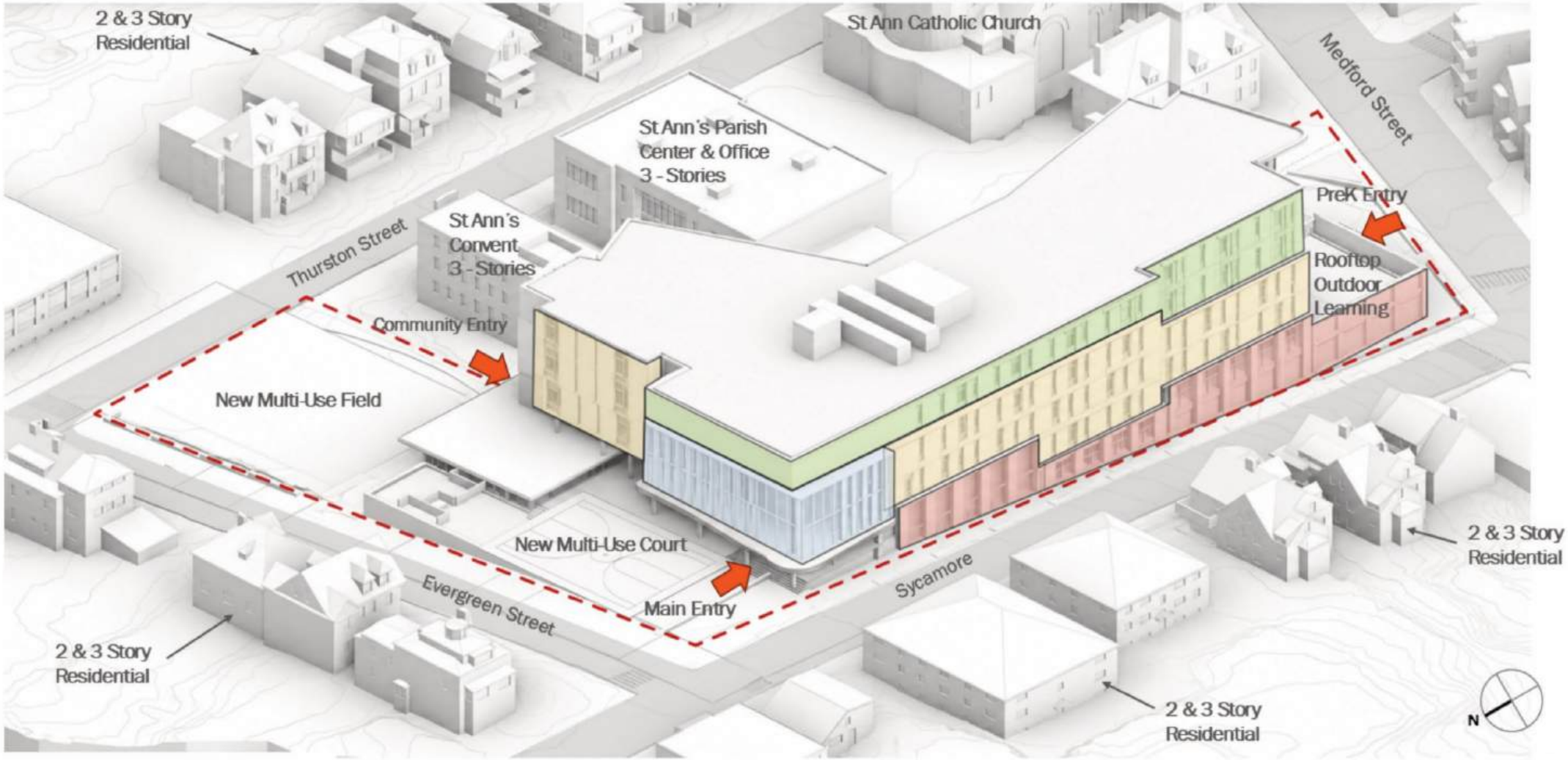
Base Massing

MASSING AND SCALE



Massing Approach

BREAKING DOWN THE SCALE **CIVIC STRATA**



Exterior Design Concepts

DEVELOPING A FACADE EXPRESSION **CIVIC STRATA**



West Elevation along Sycamore



North Elevation along Evergreen

This content was developed and curated by Perkins Eastman with the use of AI tools

Look and Feel Concepts

CIVIC STRATA







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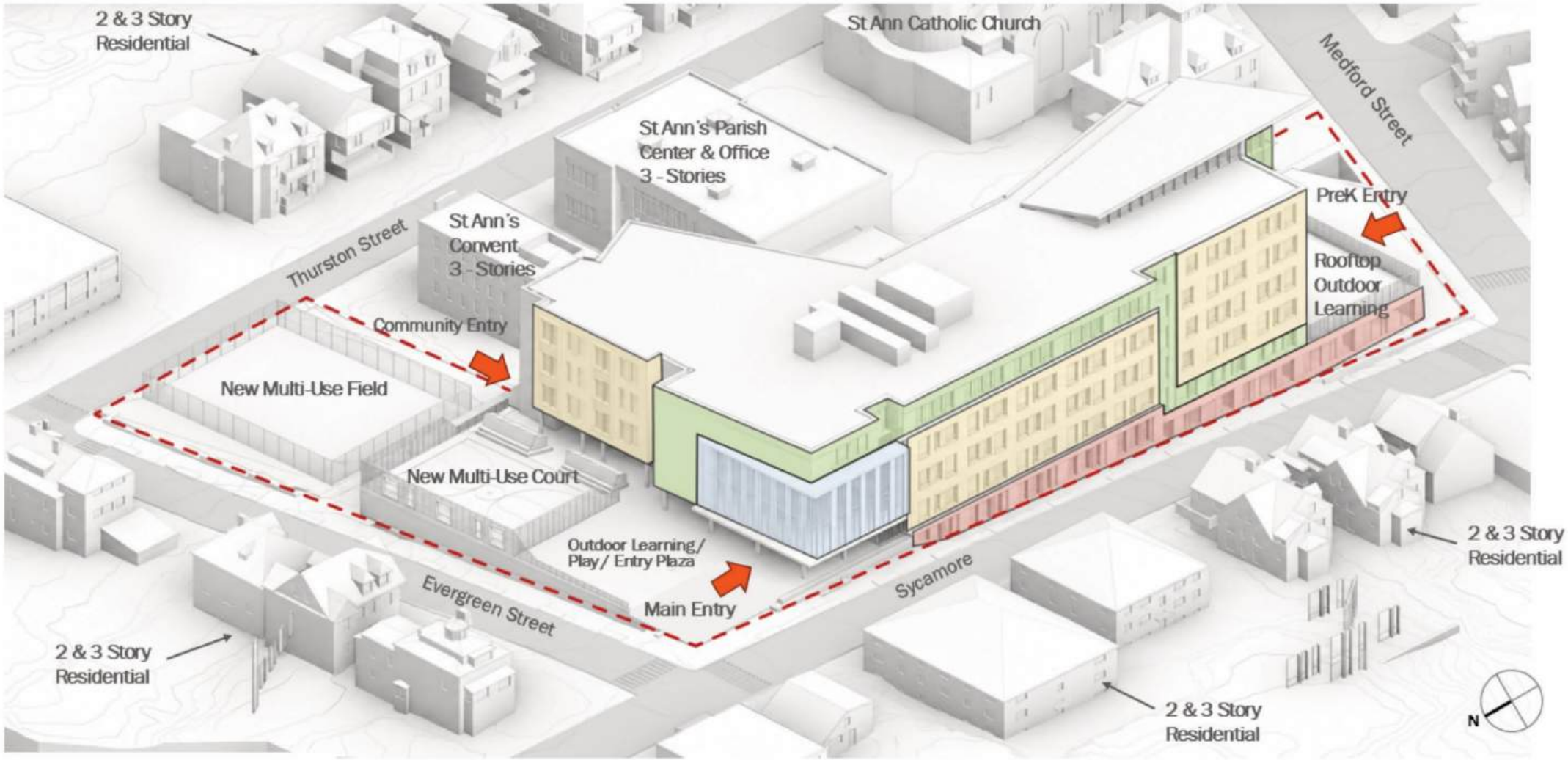
Massing Approach

BREAKING DOWN THE SCALE **LEARNING CANVAS**



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DEVELOPING A FACADE EXPRESSION **LEARNING CANVAS**



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Look and Feel Concepts

LEARNING CANVAS







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SUSTAINABILITY



SUSTAINABILITY =

CREATING **AS MUCH VALUE AS POSSIBLE**

(SOCIAL, ECONOMIC, ENVIRONMENTAL)

BY HAVING **A MEASURABLY POSITIVE IMPACT.**

MSBA REQUIREMENTS

Minimum Requirements per MSBA Project Advisory #100:

Achieve **Silver** using LEED-Schools v4.0 / v4.1

Achieve a minimum of 3 (out of 7) points in the following:

- MR – Building Product Disclosure and Optimization, v4.1 – Material Ingredients (1 point)
  - Specify at least 20 different products from 5 different manufacturers that meet green certification standards
- EQ – Low Emitting Materials, v4.1 (1 point)
  - Pursuing: Walls, Flooring, Ceilings
  - Optional: Paints + Coatings, Adhesives + Sealants, Walls, Furniture, Composite wood
- EQ – Indoor Air Quality Assessment, v4.0 (1 point)
  - Perform pre-occupancy building flush-out

The school must meet the minimum energy efficiency requirements described in the MA DOER "Stretch Code Green Community" standards

Be "solar ready"

MSBA INCENTIVES

- For an **extra 3% reimbursement** the project must meet the **Opt-In Specialized Stretch Energy Code**
  - To meet the Opt-In Code you can either be:
    - Net Zero (Zero Energy Pathway)
    - **All Electric Pathway - baseline assumption**
    - Mixed Fuel Pathway (not recommended b/c lose utility incentives)

- For an **additional 1% reimbursement** the project must earn additional material/air quality points (earn 5 of 7 available)
  - MR – Building Product Disclosure and Optimization, v4.1 Material Ingredients (1 point)
  - EQ – Low Emitting Materials, v4.1 (1 point)
  - EQ – Indoor Air Quality Assessment, v4.0 (1 point)

Why LEED? Building a Better School for Our Community

- LEED (Leadership in Energy and Environmental Design) is a globally recognized framework that helps design teams create **healthier, more sustainable buildings**.
- For the new school, LEED helps us ask important questions:



Healthy Spaces
How can we support clean air, daylight, and student well-being?



Learning Opportunities
How can the school building itself help students learn about sustainability?



Environmental Stewardship
How can we conserve water, reduce waste, and protect natural resources?



Responsible Energy Use
How can we reduce energy use and long-term operating costs?

- LEED gives our design team **a shared roadmap to turn these priorities into measurable design goals.**

LEED Rating System: Overview

Location and Transportation

Sustainable Sites

Water Efficiency

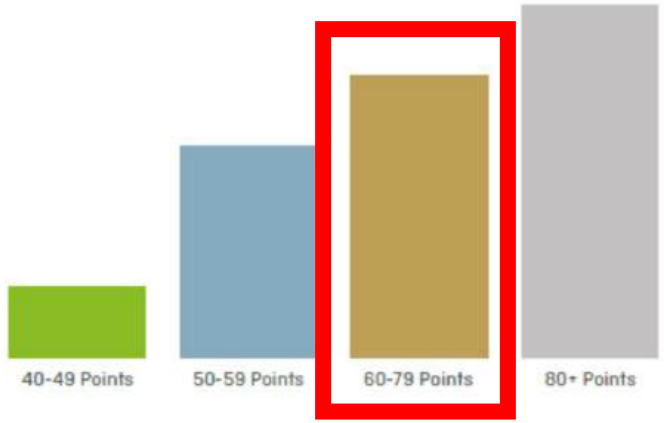
Energy and Atmosphere

Materials and Resources

Indoor Environmental Quality

Innovation

Regional Priority Credits

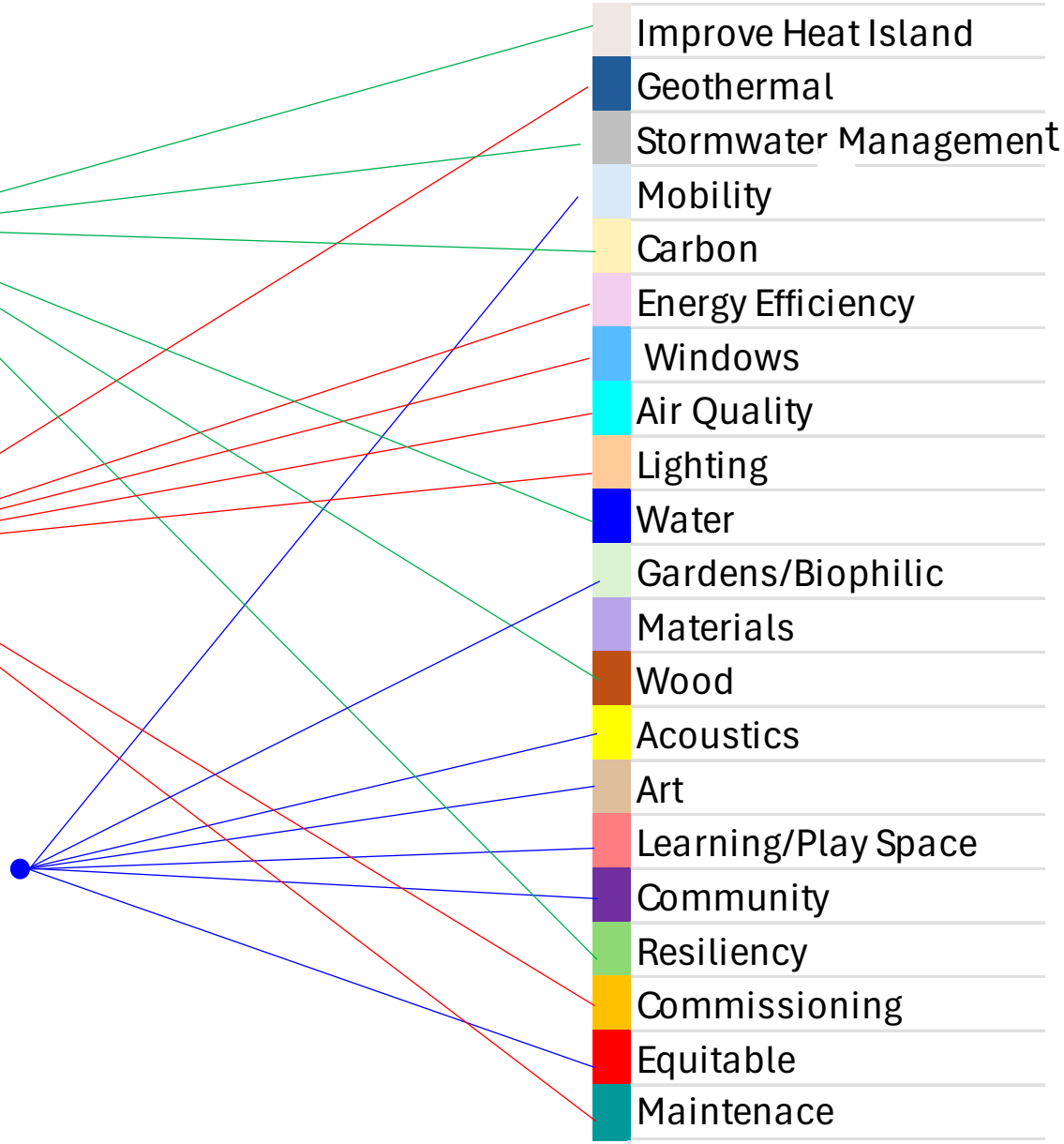


SUSTAINABLE GOAL SETTING

CLIMATE

ENERGY

COMMUNITY/
LEARNING



CLIMATE

CLIMATE

- Embodied Carbon
- Stormwater/Water
- Heat Island
- Resiliency



CARBON EMISSIONS



Credit: Skanska

Operational Carbon

- All Electric Energy Source
- High-performance Envelope & MEP systems
- Reduce Energy Consumpiton

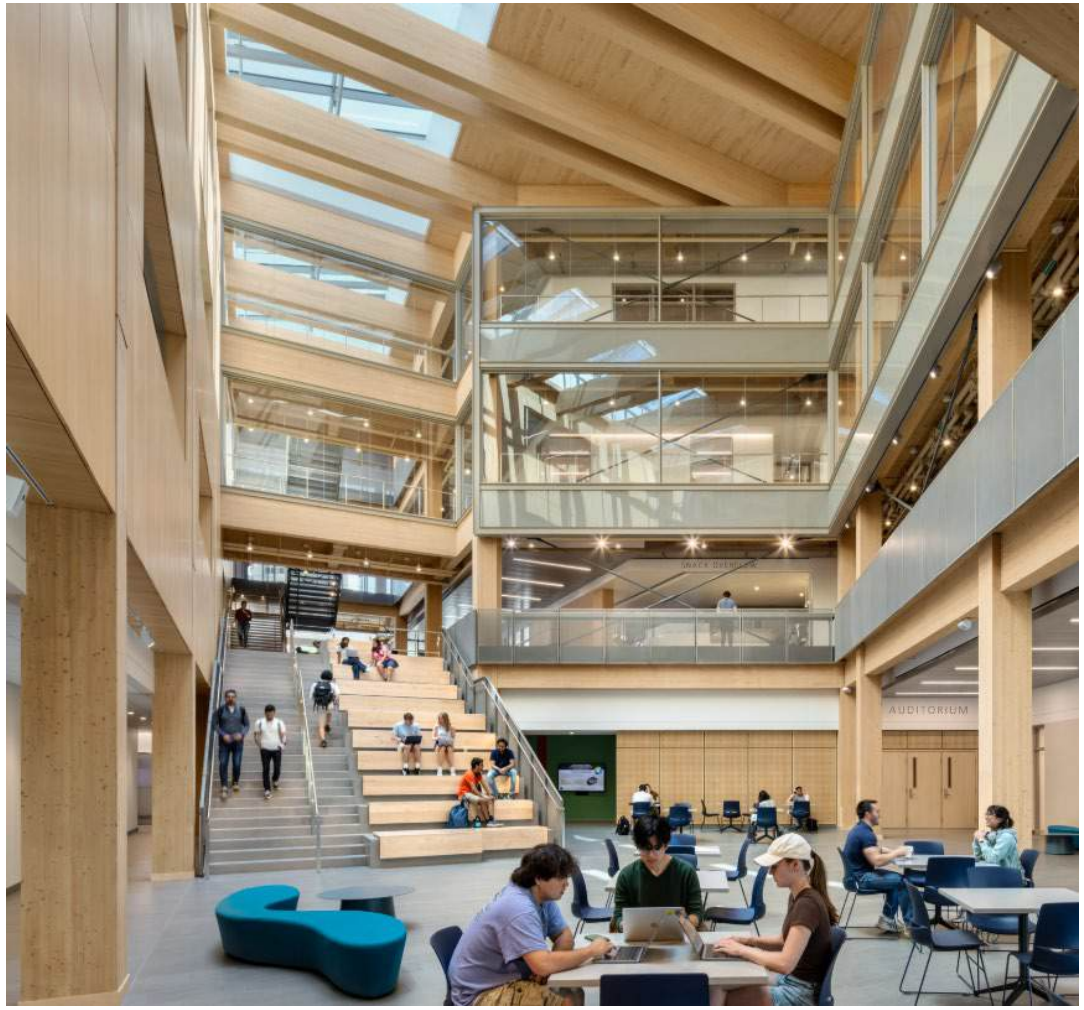
Embodied Carbon

- Concrete – Fly ash, slag, other ACMs
- Low carbon cladding and finishes

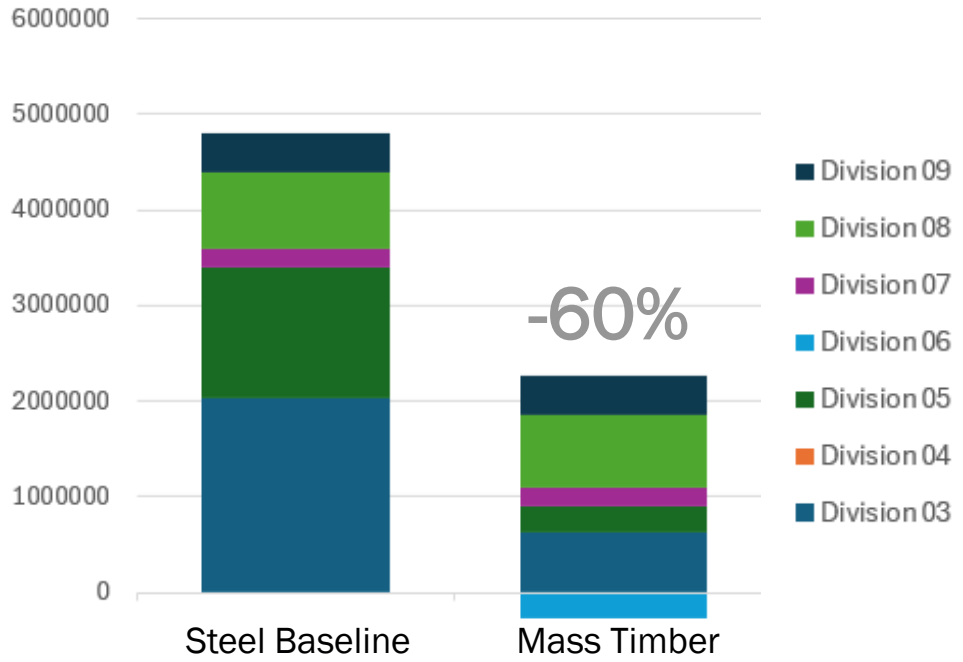
- Mass Timber
- Reduce Need for Applied Finishes
- Environmental Product Declarations (EPDs)

EMBODIED CARBON

Embodied Carbon & Sustainability
Mass timber sequesters carbon within the structural framing. Paired with all-electric systems, it significantly helps districts hit Net Zero Energy / Zero Carbon performance targets.



University of Massachusetts Amherst: Computer Sciences Laboratories



Comparison of embodied carbon from Umass CSL, showing a 60% reduction due to mass timber alone

Primary benefits of Mass Timber

- Up to 60% reduction in embodied carbon
- Beautiful natural material – its biogenic nature supports learning environment
- Cost premium varies; study suggests 0-3%* but can be cost neutral or even cheaper than steel
- Schedule savings: 20%

EMBODIED CARBON REDUCTION IDEAS









Cladding / Exterior walls:
Avoid curtainwall and aluminum panel
Consider fiber cement and brick

Reduce Material Quantity:
Smart design reduces the volume of material used, saving carbon.

Insulation:
Mineral Wool
Avoid certain types of foam insulation
If code allows, consider wood fiber.

Flooring:
Linoleum reduces carbon compared to rubber or vinyl and is healthier.

MEP systems:
Geothermal significantly reduces impact from refrigerants

STORMWATER/WATER









On-site Stormwater Management

- Retain runoff 80th-90th % rainfall event
- Onsite infiltration:
  - Rain gardens
  - Permeable paving

Native Plants

- Drought resistant plants
- Eliminate irrigation

Water Conservation

- Low Flow Plumbing Fixtures
- Metering and Leak Detection

Rain Harvesting Systems for Irrigation

- Watering for Gardens

HEAT ISLAND









Shading Structures
- Shade 50% of play and learning areas

Reflective / Cool Roofs

Trees and Vegetation
- Maximize tree canopy
- Native plants

High Albedo Pavement

Cooling Synthetic Turf Systems (PFAS free)

Vegetated Roof
- Minimize stromwater runoff
- Provide biophilic views from classrooms

RESILIENCY









Enhanced Building Envelope

Passive survivability

Operable windows

Backup power sources

Right size Emergency Generator

Portable Generators for times of need

Resiliency in Community

- Resilience Plan
- Outreach programs
  - Counseling support
  - Community heating / warming shelter for major emergencies (NOT an official FEMA shelter)

Renewable Backup power sources

- Onsite Battery Storage (need space)

ENERGY

ENERGY

- High-Performance Design
  - Passive/Climate Responsive Design
- Improve the Operations
  - Plug loads, sensors, feedback loop
  - Metering
- Net Zero Emissions
  - Eliminate fossil-fuels (Electrification)
  - Renewables
    - Photovoltaics
    - Geothermal
    - REC purchases

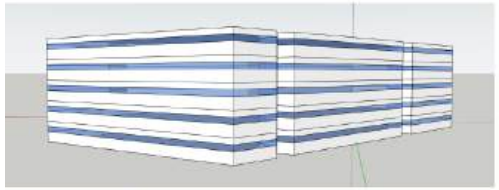
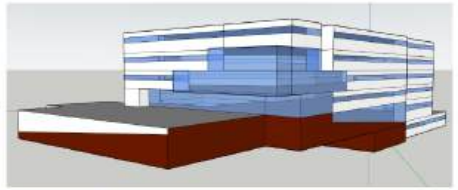
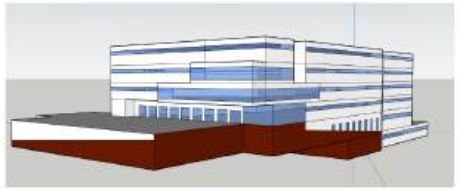
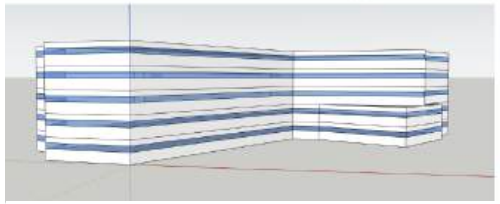
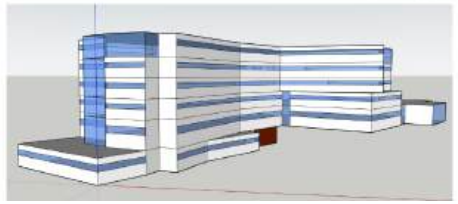
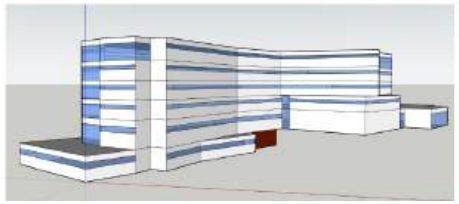


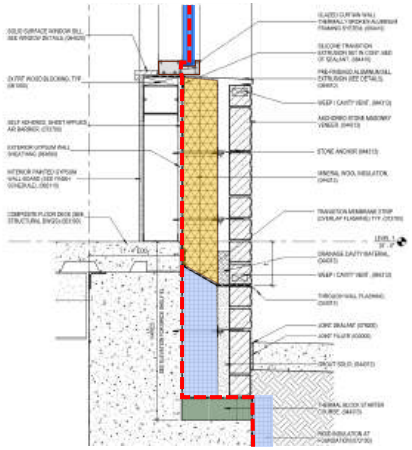
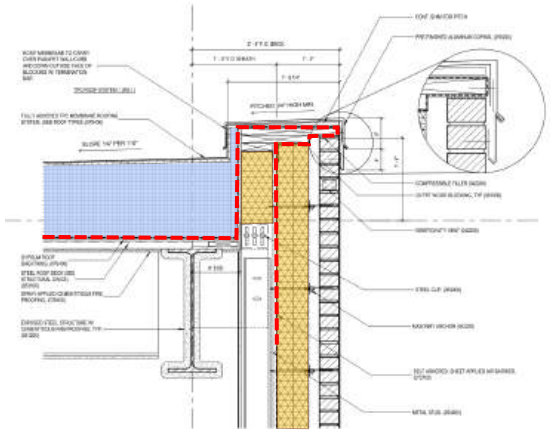
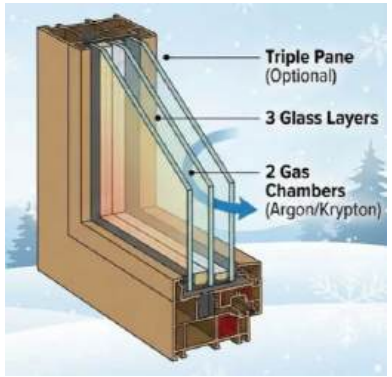
HIGH-PERFORMANCE DESIGN

3-19-26 Basic Massing
WWR: 25.0%
Envelope/GSF Ratio: 0.390
EUI: 23.7 **-2.9%**
Cooling system size: **-15%**

7-10-26 Increased WWR
WWR: 38.6%
Envelope/GSF Ratio: 0.454
EUI: 26.3 **+7.8%**
Cooling system size: **+12%**

7-23-26 Reduced WWR
WWR: 24.4%
Envelope/GSF Ratio: 0.454
EUI: 24.4 Baseline
Cooling system size: Baseline

High-performance Building Envelope
- Continuous insulation
- Balanced window-wall ratio
- Triple pane windows
- Airtight construction

High-performance HVAC Systems
- All-electric Decoupled Ventilation
- Energy Recovery
- Variable Speed Technology

Energy modeling
- Optimize design and for energy code compliance

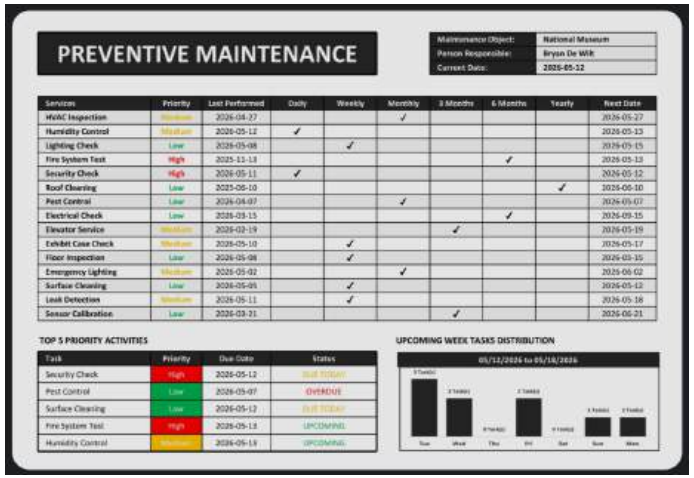
High-performance HVAC Option
- Ground-source heat pump system

IMPROVE OPERATIONS









Reduce Operational Costs

- Plug Load Control
- Occupancy Sensors
- Daylight Sensors
- Metering
- LED Lighting

Building Automation System

Preventative Maintenance Plan

Every $1 saved in operational cost saves taxpayers $1.47

U.S. school districts spend $6B each year on energy (second only to salaries)

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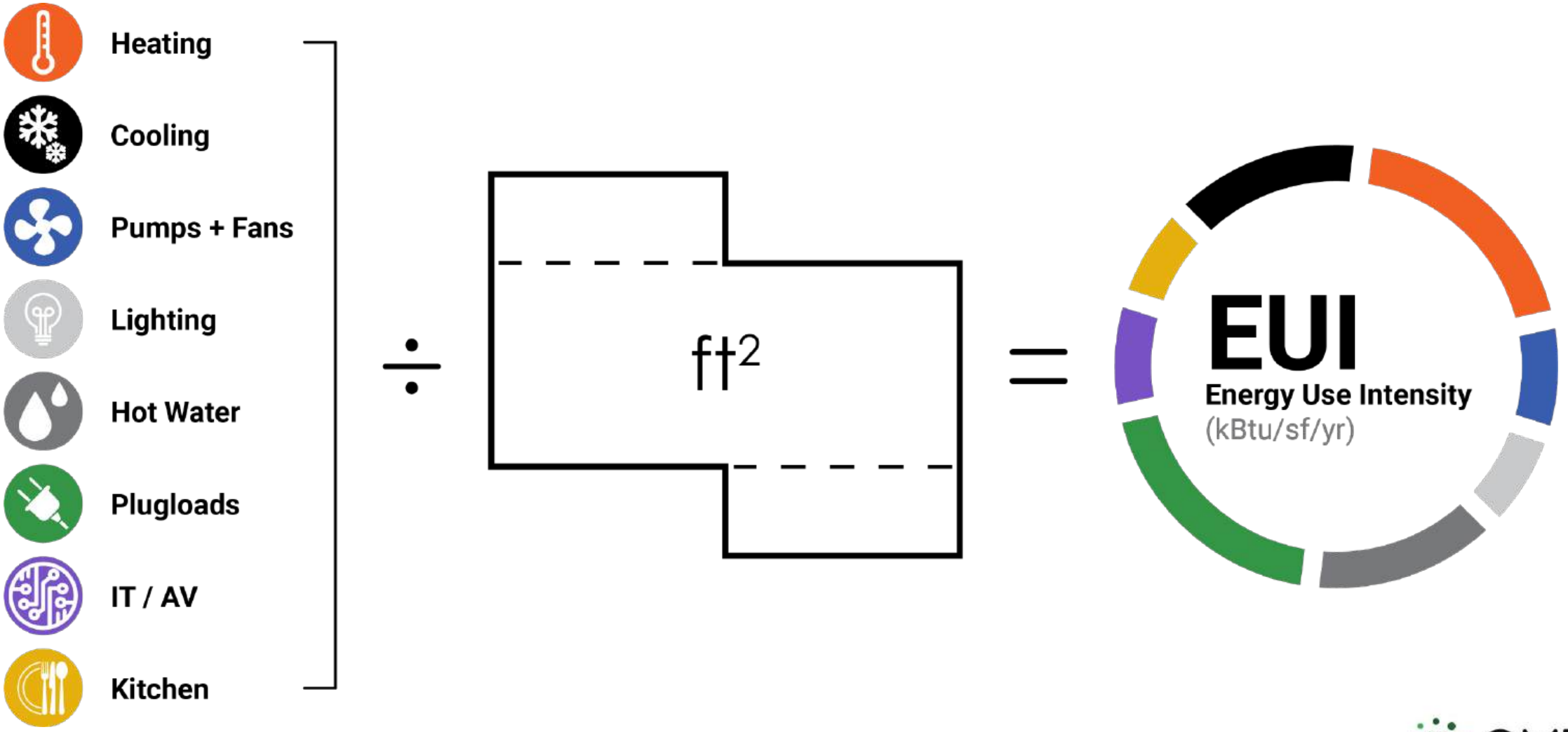
What is EUI?



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EUI: THE BUILDING'S MPG

EUI (Energy Use Intensity) is like miles per gallon for a building.

CAR		BUILDING	
	**40 MPG** More Efficient		**25 EUI** More Efficient
	**20 MPG** Less Efficient		**61 EUI** Less Efficient

LOW EUI =

LOWER ENERGY BILLS

Use less energy, save money.

LOWER EMISSIONS

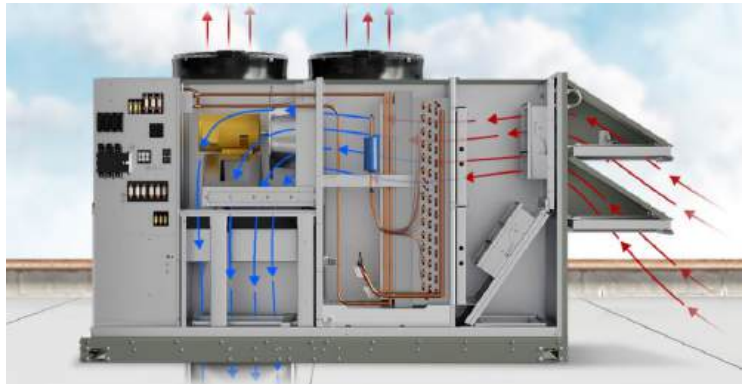
Reduce carbon emissions and support a healthier planet.

BETTER BUILDING PERFORMANCE

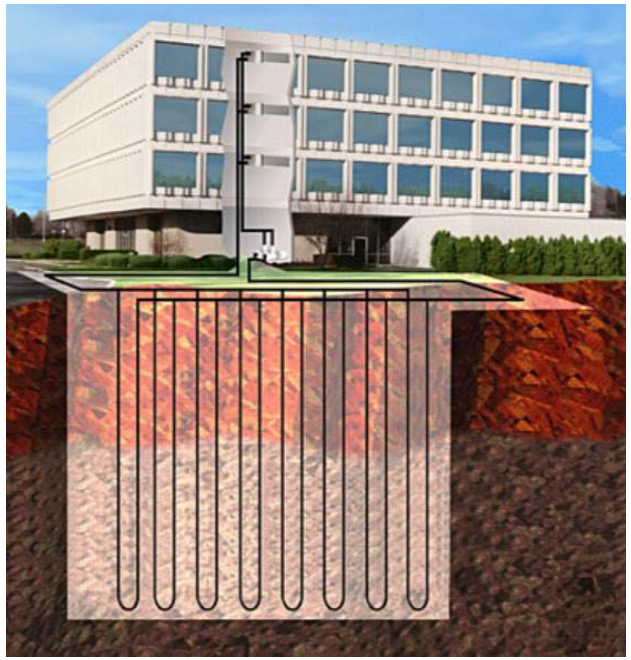
More comfortable, healthier, and more productive learning environments.

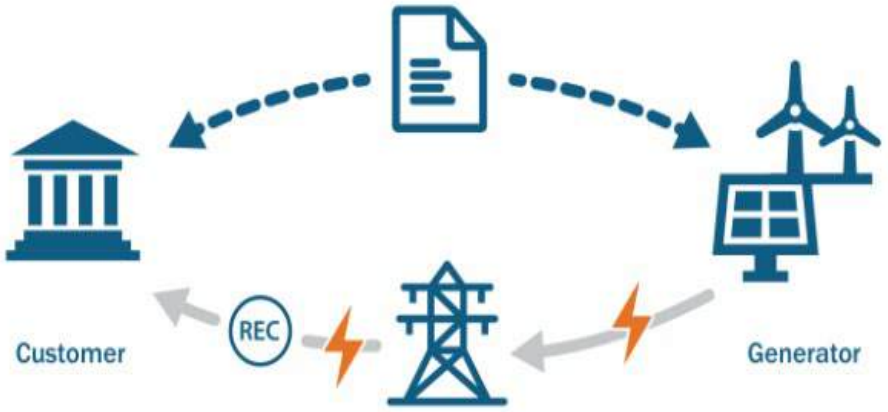
Lower EUI means a more efficient school today and a better investment for our community tomorrow.

NET ZERO EMISSIONS









Eliminate fossil-fuels (Electrification)

- Air source Heat Pumps

On-Site Renewable Energy

- Photovoltaics

- Geothermal Wells

Off-Site Renewable Energy

Remote Renewables Energy
(Renewable Energy Certificate)

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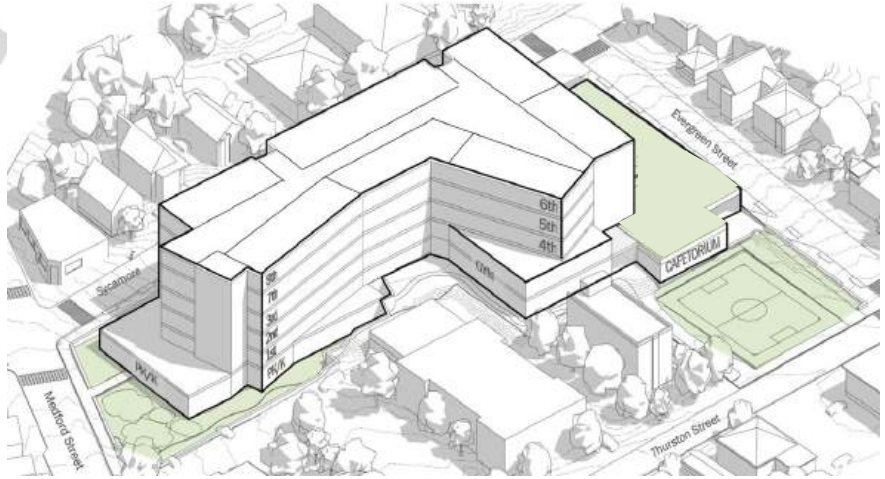
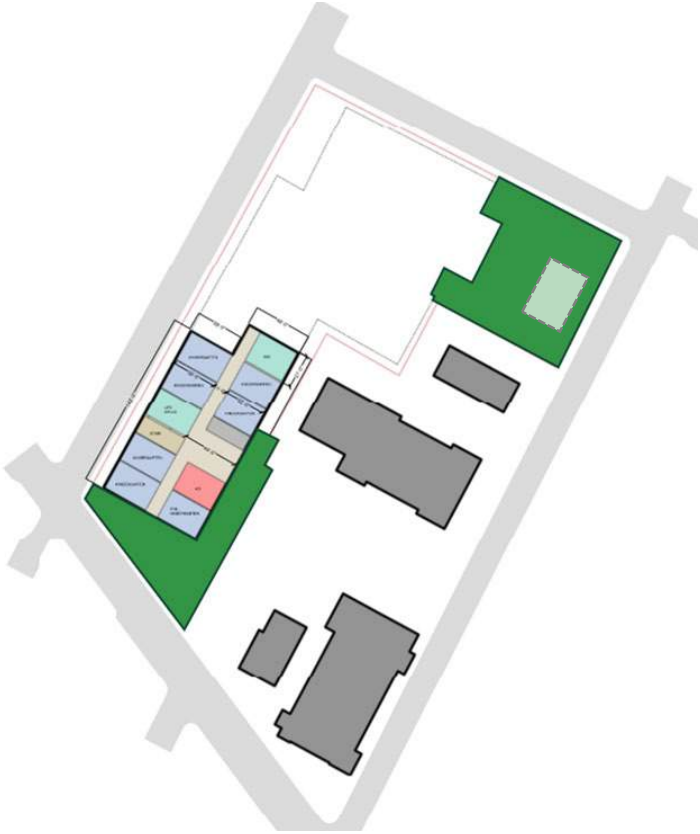
Site Challenges & Opportunities for Geothermal

Given typical geothermal well depth and spacing approx. 55% of the wellfield required for a fully geothermal system fits within the site.







Well depth is dependent on test well data. Deeper wells provide more capacity but have further cost implications.

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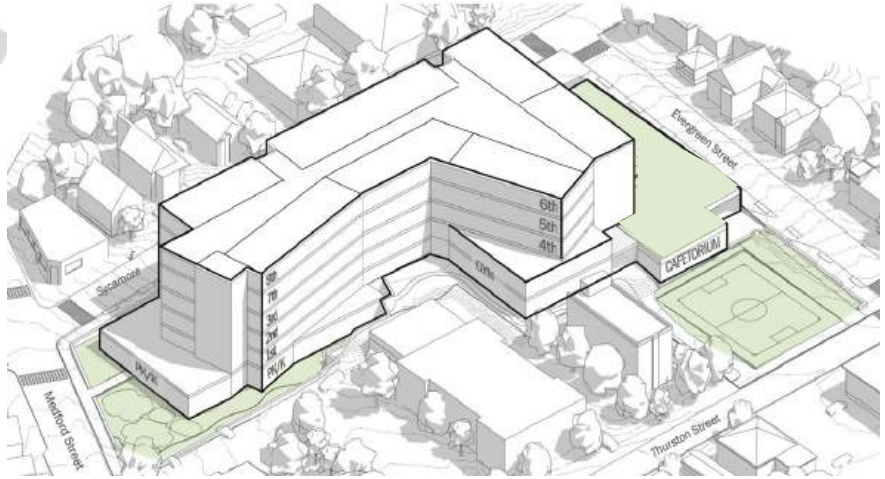
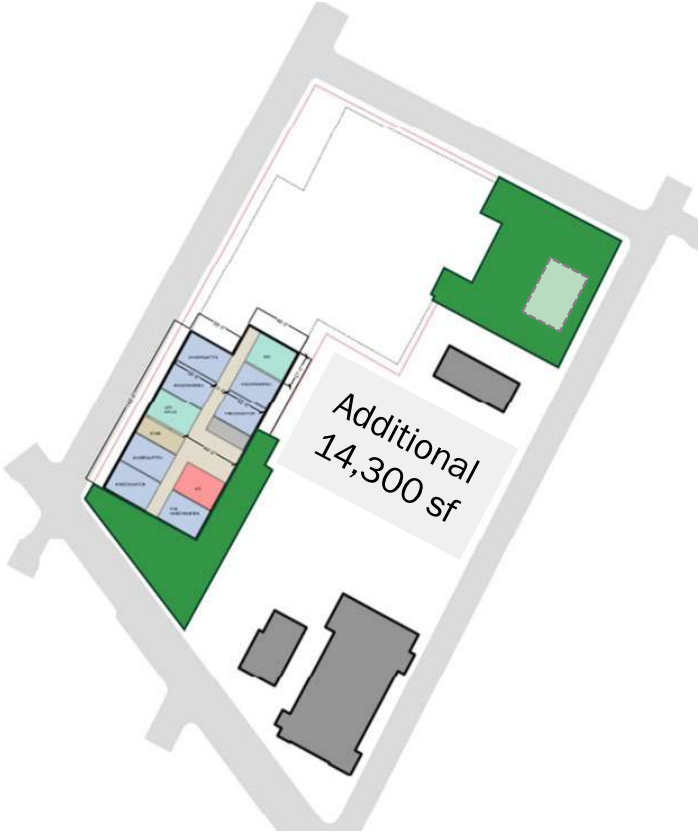
Site Challenges & Opportunities for Geothermal

An additional 14,300 sf of wellfield area would be needed for the building to use a full geothermal system.







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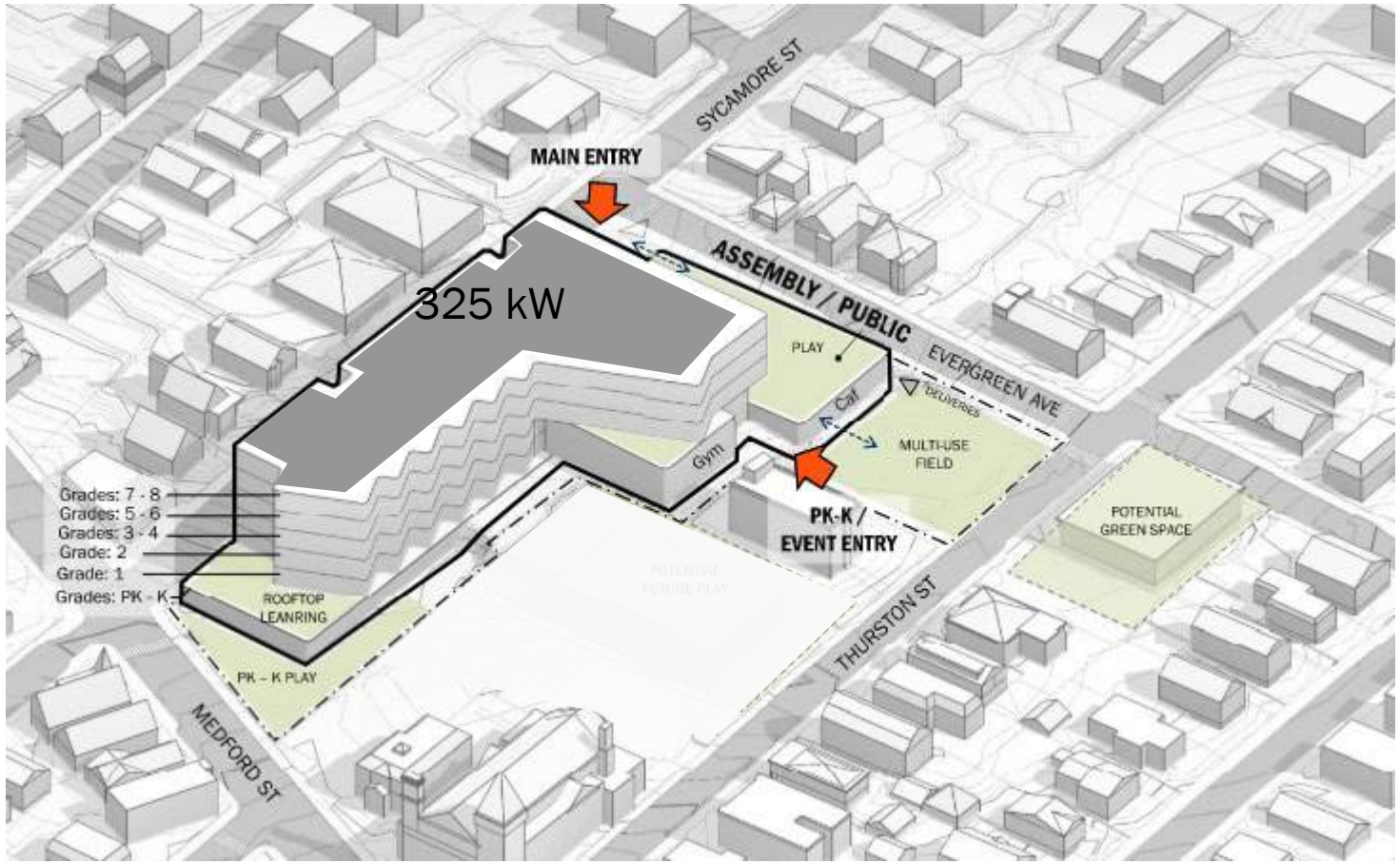
Site Challenges & Opportunities for Solar



325 kW Potential
Rooftop Solar Array

Solar generation can be maximized with roof-mounted PV arrays and solar canopies above mechanical equipment on the roof.

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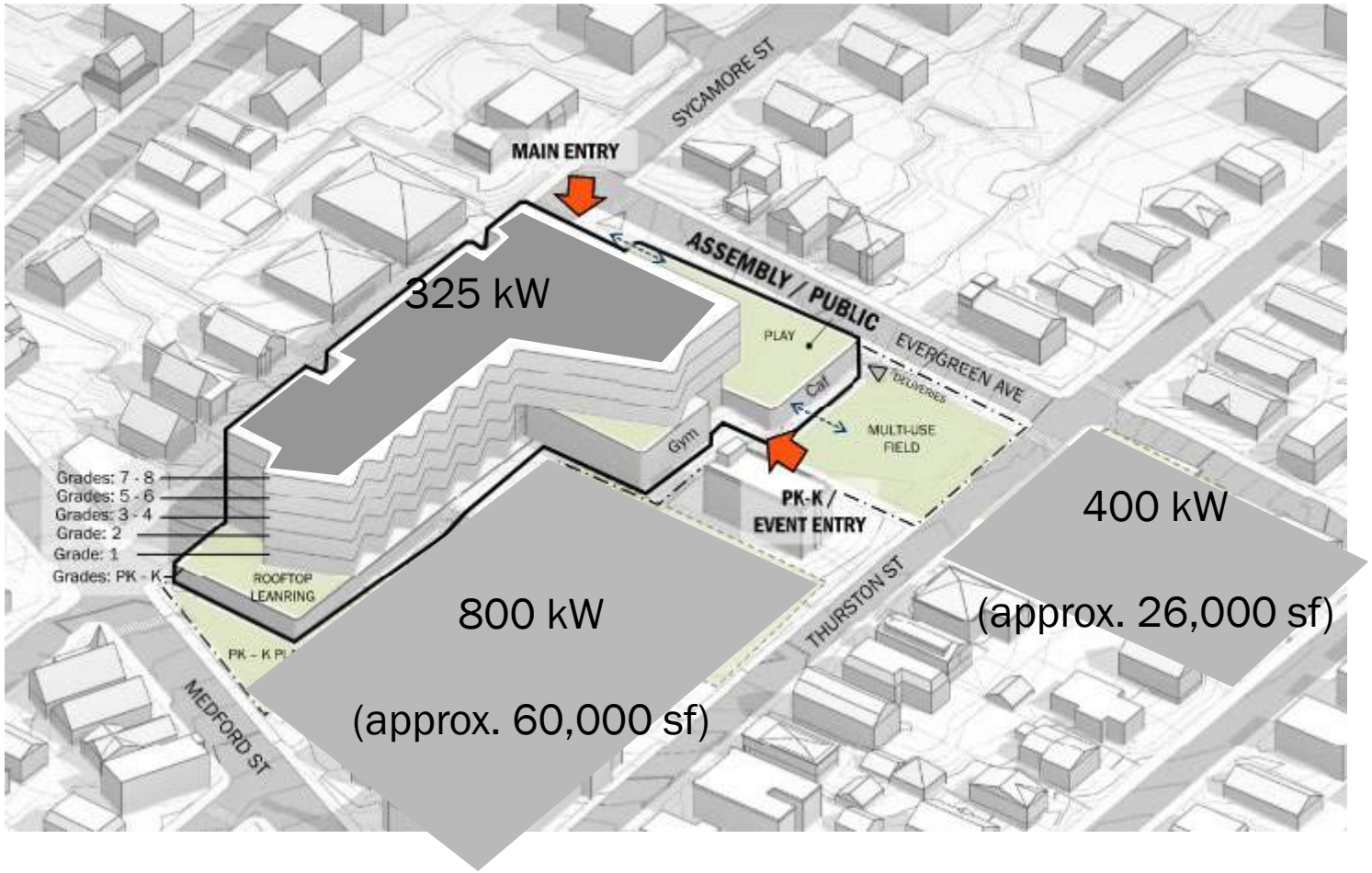
Site Challenges & Opportunities for Solar



325 kW Potential
Rooftop Solar Array

800-1200 kW in Addition
for Net Zero Energy (Site)

The site would need to be expanded to be Net Zero Energy (site). Net Zero Carbon is possible though sourcing renewable energy.

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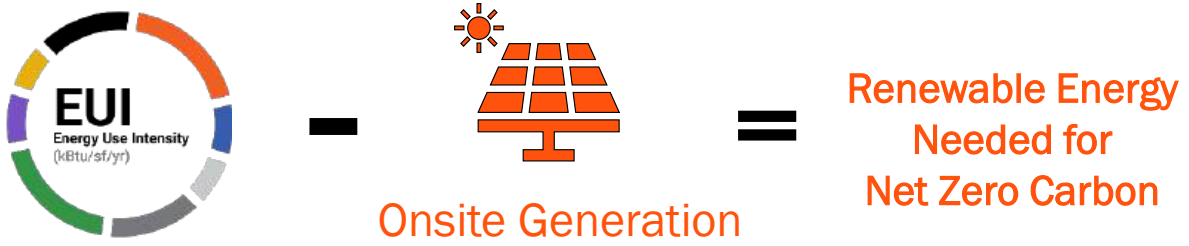
HVAC System Options & Impact on EUI

HVAC System Option	EUI Range	Site and Roof Impacts	Incentive Eligibility
Full Geothermal System	18-22 kbtu/sf Per Year	Requires deeper wells within site and/or additional wellfield space outside site boundary	- Mass Save $/sf and $/ton - Investment Tax Credit
Hybrid Geothermal/Air Source Heat Pump System	22-25 kbtu/sf Per Year	Maximizes wellfield within site boundary; Requires additional roof space for air source heat pumps	- Mass Save $/sf and $/ton - Investment Tax Credit
Air Source Heat Pump System	25-30 kbtu/sf Per Year	Requires the most rooftop space for mechanical equipment across the options	- Mass Save $/sf and $/ton

Net Zero Carbon Potential

Net Zero Carbon = does not produce emissions during operation

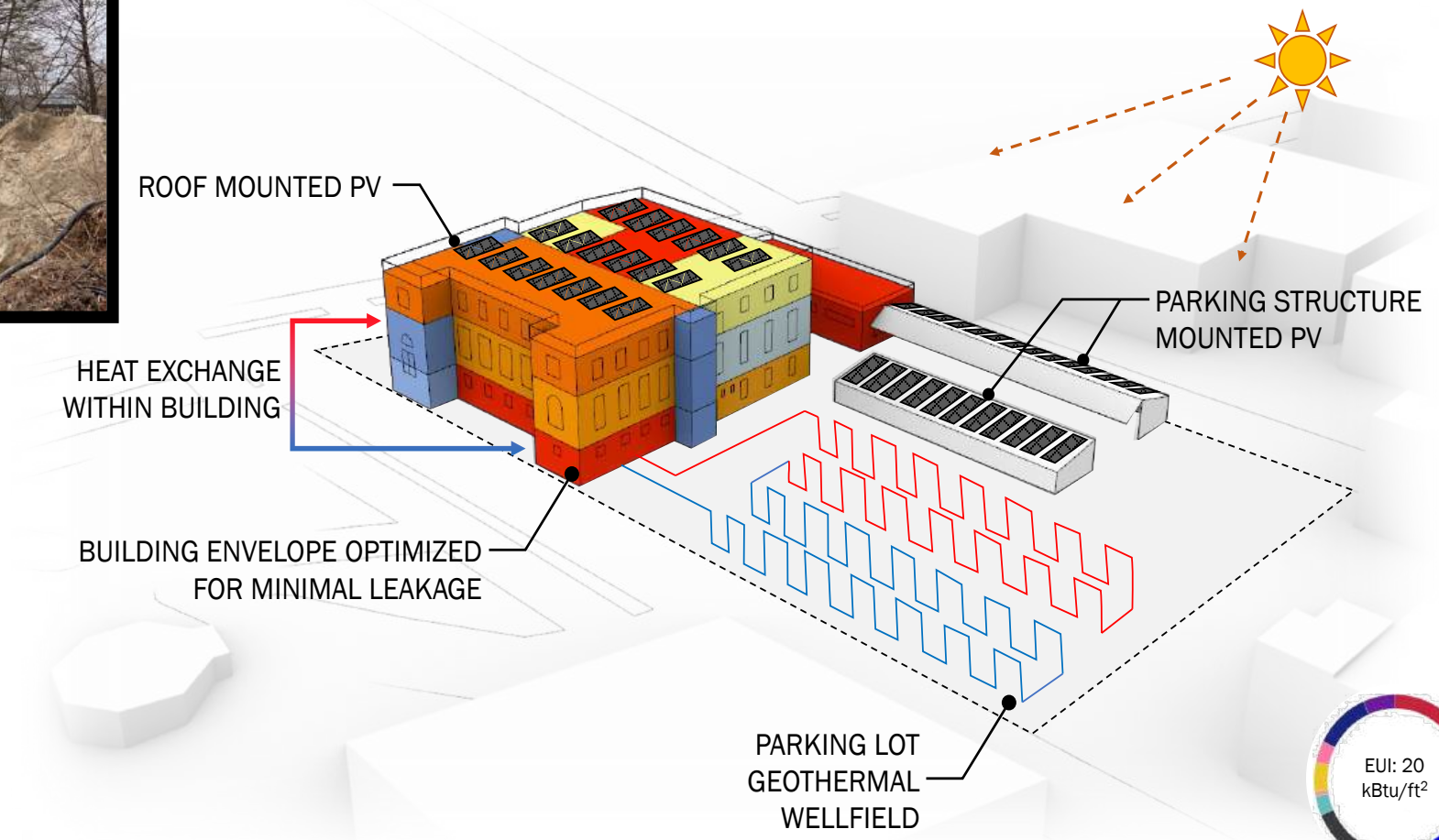


HVAC System Option	Approx. EUI	EUI Offset by Solar PV	Renewable Energy Needed for Net Zero Carbon
Full Geothermal System	20 kbtu/sf	6.5 kbtu/sf (33%)	13.5 kbtu/sf
Hybrid Geothermal/Air Source Heat Pump System	23 kbtu/sf	6.5 kbtu/sf (28%)	16.5 kbtu/sf
Air Source Heat Pump System	27 kbtu/sf	6.5 kbtu/sf (24%)	20.5 kbtu/sf

GROUND SOURCE HEAT PUMPS







COMMUNITY / LEARNING

COMMUNITY/LEARNING

- Shared Community Use
- Learning Opportunities
- Equitable/Universal Design
- Well-Being
  - Air Quality
  - Comfort
  - Acoustics
  - Biophilic



SHARED COMMUNITY USE









Community Access to Site and Building

- Out of School Time Programs
- Year-Round Public Use
- Summer programs
- Opportunities for new programs

Active Play Areas

- Safe and Secure open space for children and adults

Warming / Cooling Shelter

- Community access to Gymnasium and Cafeteria

Production Kitchen

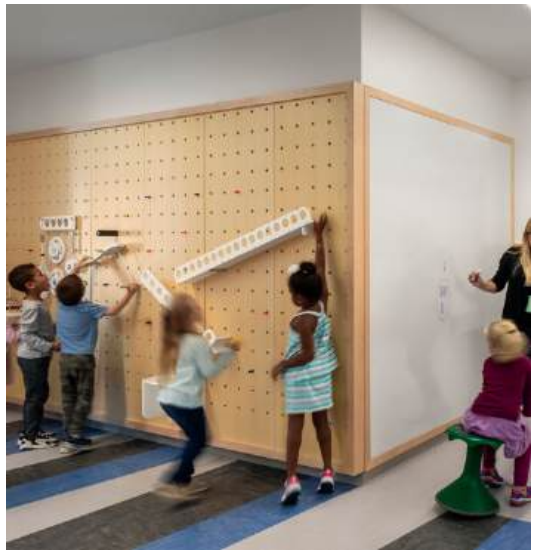
- K-8 Food Service Distribution
- Services for Summer Programs

LEARNING OPPORTUNITIES









Building and Site Features to Educate Students

- Educational Signage for Energy, Water, Materials and Ecology

Interactive Displays

- Age-appropriate displays for both elementary and middle school students
- Digital Interactive Displays

Interchangeable Displays

- Team Building
- Gross Motor Development

Gardens

- Core Academics
- Environmental Science
- Healthy Eating

EQUITABLE/UNIVERSAL









Universal Design

- Universal Play Structures
- Universal Transitions

Equitable

- Age-Appropriate Furniture and Casework for K though 8
- Age-Appropriate playground structures

Signage

- Use Fonts that Support Dyslexic Readers

WELL-BEING









Comfort

- Enhance Indoor Air Quality
- Daylighting and Glare Control

Acoustics

- Sound Absorption
- Acoustical Barriers/Separation

Biophilia

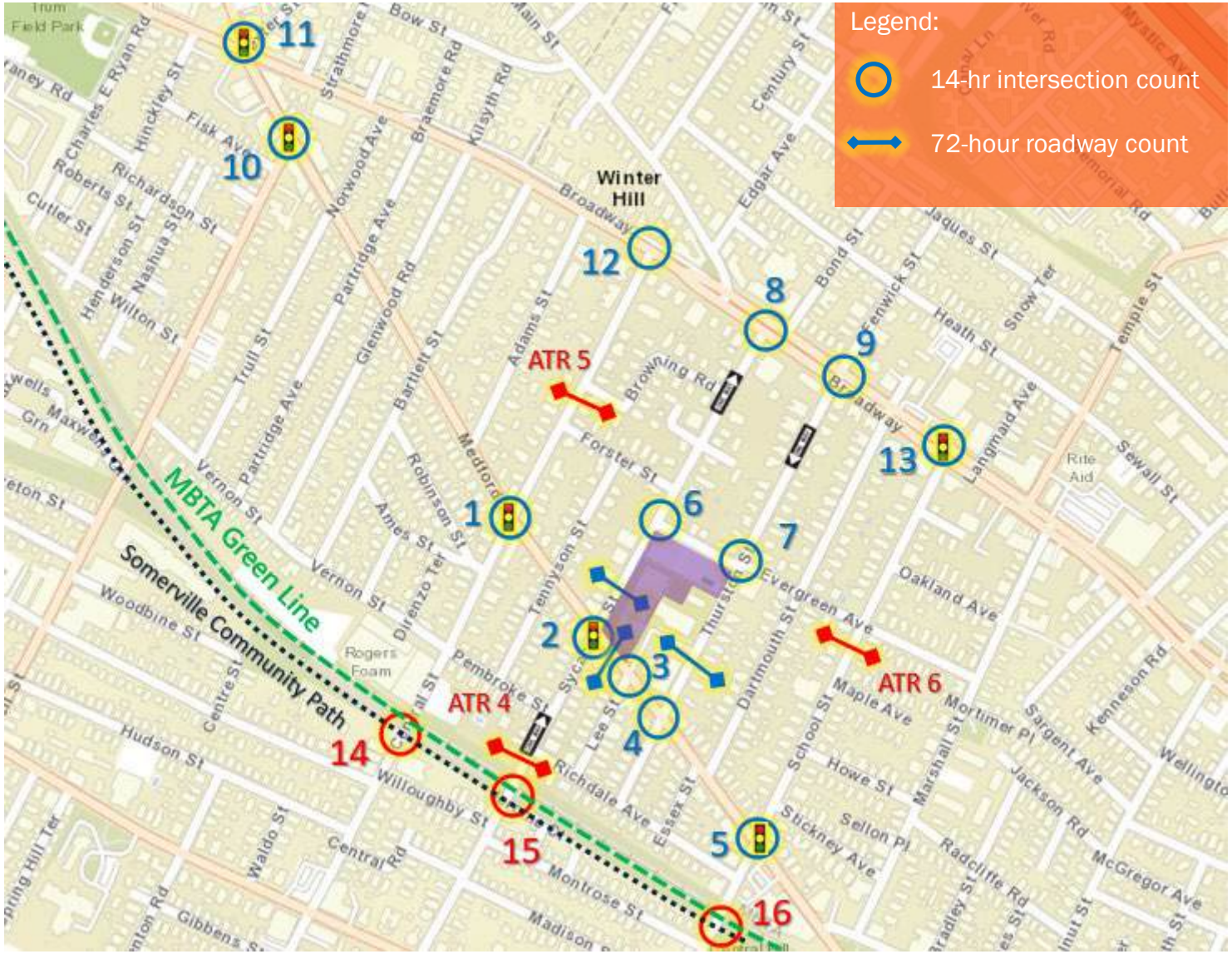
- Natural Elements and Colors
- Indoor / Outdoor Connections

Bike/Scooter Parking Area



TRANSPORTATION

TRANSPORTATION ANALYSIS



- CITY SCOPING
- MOBILITY MANAGEMENT PLAN
- TRANSPORTATION ACCESS PLAN
- TRANSPORTATION IMPACT STUDY
- TRANSIT ANALYSIS
- BICYCLE/PEDESTRIAN “LEVEL OF STRESS”

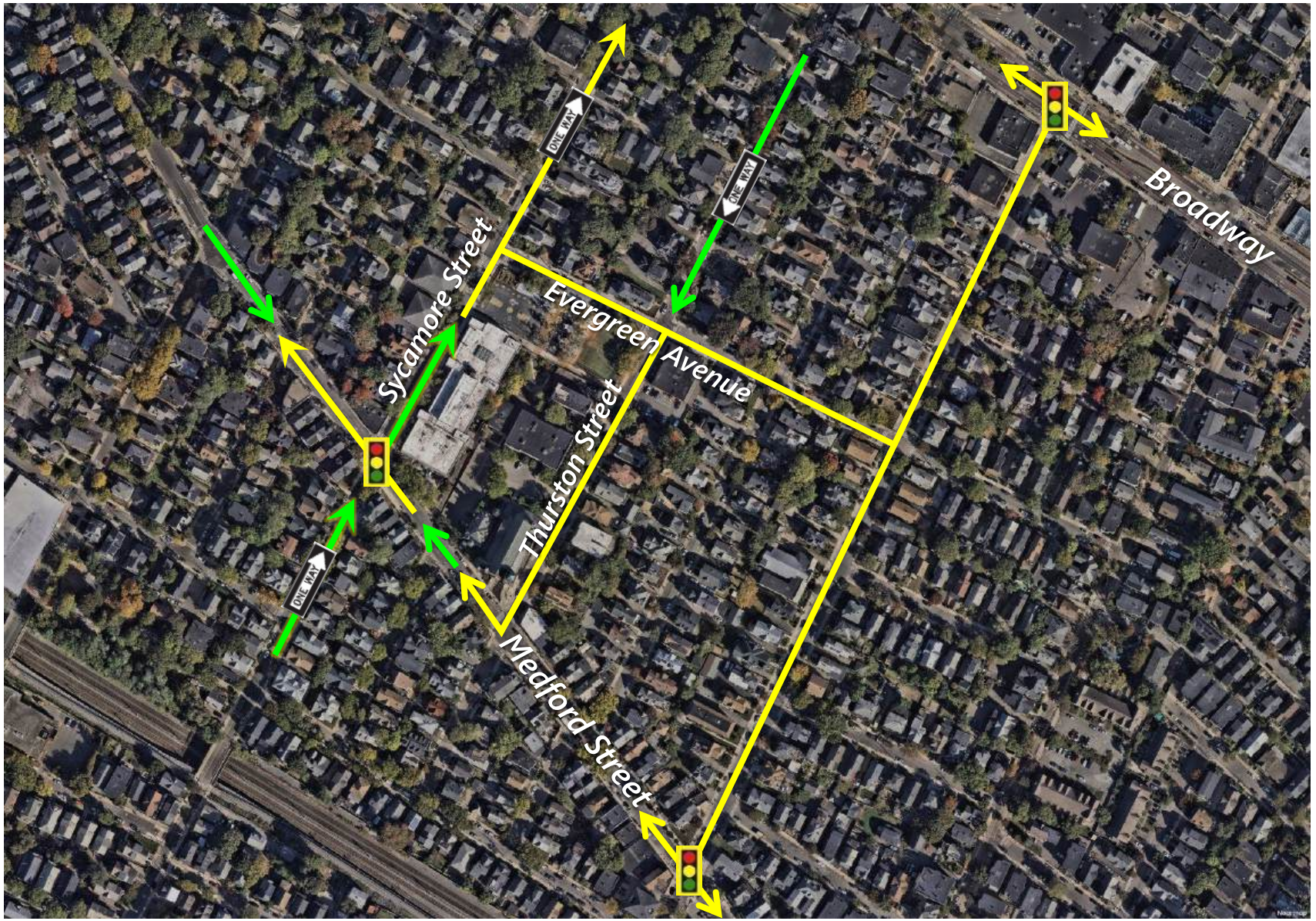
<u>TRAFFIC COUNTING:</u>
FOLLOWING DATA WAS COLLECTED OCTOBER 2026:

- WEEKDAY 6 AM-8 PM INTERSECTION COUNTS (AUTOMOBILE / PEDESTRIAN / BICYCLE)
- 72-HOUR WEEKDAY/SATURDAY DAILY COUNTS
- SOMERVILLE COMMUNITY PATH

UPCOMING DATA COLLECTION:

- EXISTING SOMERVILLE SCHOOL OBSERVATIONS

VEHICULAR SITE CIRCULATION



Circulation In

Circulation Out

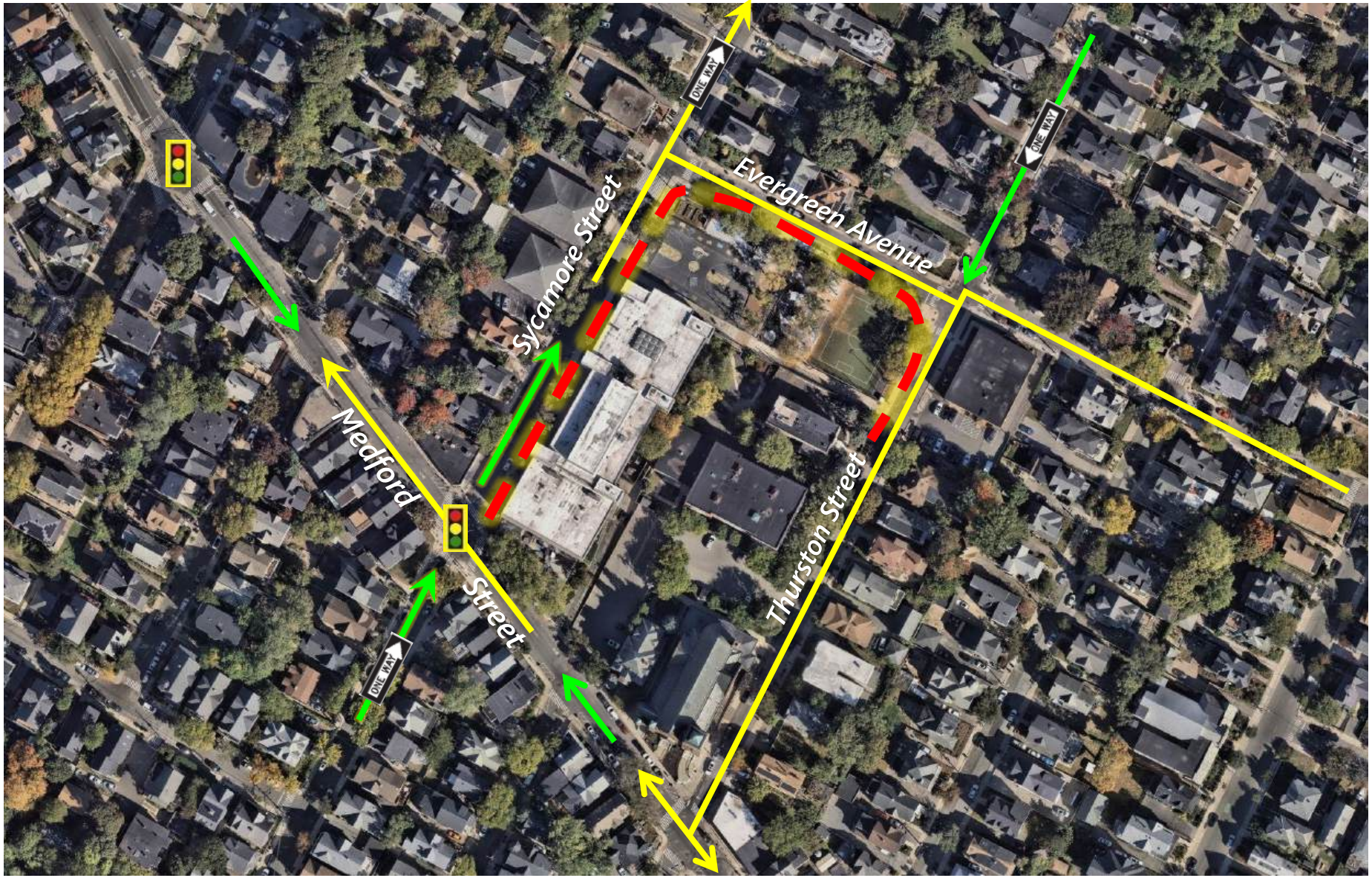
VEHICULAR SITE CIRCULATION

- PEDESTRIANS
- BIKE ACCOMMODATIONS
- PICK-UP/DROP-OFF
- COMMUNITY PATH
- TRAFFIC CALMING
- CONSISTENCY
- LOADING

Potential pick-up / drop-off

Circulation In

Circulation Out



Q & A

BREAKOUT DISCUSSION

CLIMATE

- Embodied Carbon
- Stormwater/Water
- Heat Island
- Resiliency

ENERGY

- High-Performance Design
- Improve the Operations
- Net Zero Emissions
- On-site renewables

COMMUNITY/LEARNING

- Shared Community Use
- Learning Opportunities
- Equitable/Universal
- Well-Being

TRANSPORTATION

- Transportation Analysis
- Circulation

SITE

- Site Design Options

THANK YOU